

## THE DE BAY PROPELLOR.

The De Bay propellor, an English invention, which has attracted much attention since its efficiency was made public by a series of experiments in 1879, has recently been fitted to a steamship of a sufficient size to give a decided test of its value. The *Cora Maria*, a steamer of 831 tons net register and 2,800 tons displacement, was the vessel used for the experiments. Her dimensions are: Length, 235 feet; breadth, 31 feet; depth, 18 feet 3 inches. Her engines are of the compound inverted cylinder and surface condensing type, the high pressure cylinder being 28 inches, and the low pressure cylinder being 54 inches in diameter, with a stroke of 3 feet. The screw used in the first experiment was an ordinary four-bladed screw, having a diameter of 13 feet 2½ inches, and a pitch of 19 feet 6 inches. With this screw a trial was made over a course of two and one-fifth knots on the 10th of July last, and then the DeBay gearing and propellor (diameter 11 feet) were fitted to the vessel and a trial was made under exactly similar conditions on the 10th of August. The results obtained from each trial are herewith tabulated for comparison, it being understood that in each case four runs over the course were made, the first and third being with the tide and the second and fourth against it.

	Ordinary screw.	De Bay propellor.
Average revolutions per minute.....	66.32	65
Average steam pressure, pounds.....	74.7	74.5
Average vacuum, inches.....	25.58	24.25
Indicated horse power.....	584.51	585

## TIME.

	First course.	Second.	Third.	Fourth.
Ordinary screw.. 12m. 5s.	20m. 27s.	12m. 3s.	19m. 56s.	
De Bay propellor. 9m. 4s.	16m. 42s.	9m. 6s.	16m. 10s.	

## SPEED IN KNOTS PER HOUR.

	First course.	Second.	Third.	Fourth.
Ordinary screw.....	10.924	6.45	10.954	6.62
De Bay propellor.....	14.567	7.898	14.505	8.162

## TURNING THE CIRCLE.

	Ordinary screw.	De Bay propellor.
To port.....	4m. 44s.	4m. 33s.
To starboard.....	6m. 51s.	5m. 4s.

The mean speed obtained on each trial was 8.73 knots for the ordinary screw and 11.28 knots for the De Bay propellor, or an actual gain for the latter of over 29 per cent. for the same expenditure of power. Assuming that the resistance varies as the cube of the speed (and practically this ratio is greatly exceeded), since it required 584.51 horse power to drive the *Cora Maria* at a mean speed of 8.73 knots with the ordinary screw, it would have required 1,256.69 horse power to drive her at the speed of 11.28 knots obtained by the De Bay propellor. We might easily go on to calculate the immense saving in fuel thus obtained, but the foregoing figures are sufficient to call attention to the advantages of the new propellor.

With the ordinary screw there is, as every one knows, a great deal of vibration, and the stern of a screw steamer shakes and quivers very unpleasantly; while the De Bay invention produces no local commotion at all.

Since the first trial in 1879 the shape of the larger half of the propellor blades has been somewhat altered. Formerly they were designed so that they nearly filled up a segment of a circle having the same diameter as the propellor. They now have a curved form in place of an angle, and each blade, instead of a uniformly increasing pitch, has a pitch of 17 feet to half radius; increasing therefrom to a pitch of 19 feet to 21 feet.

The *Cora Maria* is now on a voyage to Alexandria, Egypt, with a full cargo, and the reports of her captain and engineer will be awaited with great interest.

—The trial of the *Albert Victor*, the new steamer for the Channel service for the South Eastern Railway Company, is a triumph for all concerned in her building. Not only is she a very fast vessel, but is remarkably steady and dry. The *Albert Victor* is 250 ft. in length, 29 ft. in breadth, and 15 ft. 6 in. depth; her builder's tonnage is 1,040 tons, and the horse-power developed by her oscillating paddle engines is 2,800. She made the run from Gravesend to Folkestone, a distance of 84 miles, in 3 hours 46 minutes, the weather being rather unfavorable. A cracked cylinder has, however, necessitated her return to the Thames.

## THE FURNITURE AND CABINET FINISHER.

This is another of those useful manuals published by Jesse Haney & Co., and which should be in the hand of every cabinet-maker, it being a practical guide, giving the latest approved methods and recipes for this branch of woodwork.—Among the many valuable chapters for finishing we may mention, those on polishing materials, puttying, glueing, varnishing, darkening wood, preparing wood for finishing, bleaching, stains for all kinds of wood, dyeing wood, fillers, piano finish, dead finish, oil finish, wax finish, French polish, enamelling furniture, tables of tints, painting, ornamentation, graining, marbling on wood, veneering, marqueterie, Buhl work, inlaying, and many miscellaneous receipts.

Parties desiring this work can obtain the same by remitting 50 cents to F. N. BOXER, 243 St. Denis St, Montreal.

**BOILER INSPECTION IN FRANCE.**—It is stated that the systematic inspection of boilers, especially in the north of France, has been attended with the happiest results. The French government has recognized as "of public utility" the Steam Users' Association of the Nord, which was founded in 1873. Its objects are the prevention of explosions and other accidents, and the dissemination of useful information as to the generation of steam, together with remarkable facts and discoveries relating to economy of fuel. The board of management consists of twelve members, elected at the annual general meeting and its staff comprises an engineer-in-chief, three other engineers, for inspectors, three draughtsmen, and an accountant and treasurer. The engineers are selected from among the old pupils of the Ecole Polytechnique and the Institut Industriel du Nord; the inspectors from the first-class engineers on railways, and the best pupils at the Ecole des Arts et Métiers et Chalons. Two inspections are annually made on the premises of members. The first is confined to the external parts of the boiler and its appurtenances, the engineer at the same time giving such useful hints to the engine tender as may seem necessary. The second is a more minute examination, inside and out, and a written report is afterward presented to the responsible manager. The number of boilers under inspection has increased from 526 to 1,108 belonging to 328 establishments, and with the following results:

	1873-4.	1876-7.
Per ct.	Per ct.	
Steam gauge in good condition.....	40	92
Safety valves in good condition.....	63	98
Boilers with glass tubes.....	30	78
Number of boilers with old-fashioned water gauges.....	65	4

Only two accidents have occurred since 1873. In one case the owner of the boiler had just joined the association, and his premises had not been thoroughly inspected, while in the other, the manufacturer had objected to that course, and thus rendered himself liable to expulsion from the society.—*Iron*.

—The *American Journal of Pharmacy* notices the occurrence, in the Russian Caucasus, of two lakes which contain immense quantities of sodium sulphate, from which this salt is obtained in an almost pure state. The lakes have no exit, fill up in the wet season, and in summer their contents partially evaporate. The salt is obtained in layers of from a quarter to four inches thick, as it separates in consequence of cold or by evaporation in summer. Samples that were analyzed showed that the dry salt contains 95 per cent. pure sulphate, of which it has been estimated the two lakes should yield 280,000 tons. It is further said that a French company has been formed to work this deposit systematically. Of the origin of the salt our informant gives no explanation.

—Mr. R. F. Fairthorne suggests in the *American Journal of Pharmacy*, that if 3 ounces of powdered quicklime be added to a gallon of benzine, and the mixture be well shaken, most of the peculiar sulphureted-odor of the benzine will be removed, and articles that have been washed in it will have no disagreeable smell.

ORDERS have been given for a cane sugar refinery, to be erected at Tilsonburg, Ont.

JOHN Robinson, of the Bothwell Agricultural Works, is going largely into the manufacture of iron fencing.